Kansas Department of Health Environment
Bureau of Waste Management

Trench Sizing Worksheet
for Pre-Selected Livestock Disposal Sites

Line	Description	Numerical Values	Comments
Calculate disposal volume			
A	Maximum number of carcasses		This would normally be the largest number of animals allowed per the CAFO permit.
B	Number of animals per standard animal unit		Use 1 for cattle, 5 for pigs or sheep, 50 for turkeys, 333 for chickens, or other factor to reflect the situation at your facility (provide supporting information for other factors).
C	Cubic feet per animal unit		A typical 1,000-pound steer (or 5 typical pigs, or 50 typical turkeys, etc.) has a volume of 42 cubic feet.
D	Volume (cubic feet) required to dispose all carcasses		Line A divided by Line B, multiplied by Line C.
E	20% contingency for other contaminated materials		Line D times 0.2. Other contaminated materials could be bedding, manure, decontamination waste, etc. Explain if this is not applicable, or if a different factor should be applied.
F	Total disposal volume (cubic feet)		Line D plus Line E
Calculate trench dimensions			
G	Excavation depth (feet)		Normally this would be between 10 feet and 20 feet. If groundwater is shallow, it would limit how deep the trench can be (try to provide at least 10 feet separation from groundwater table). A trench less than 10 feet deep may not be practical for disposal of very large volumes of waste. If groundwater is deep, then the trench depth is limited by the practical excavation depth. Remember, the excavation must occur quickly and safely. Therefore, a maximum depth of 20 feet is assumed, based on input from the Kansas National Guard. Actual limits may vary. Also, remember that the final cover will take up at least 3 feet of the trench depth.
H	Effective depth (feet)		The final cover will reduce the depth available for disposal by at least 3 feet.
I	Width (feet)		Normally this would be wide enough for productive disposal capacity, but narrow enough to facilitate dumping waste from the rim. The Kansas National Guard has expressed a preferred width of 30 feet, and a maximum width of 50 feet. Other widths may be appropriate depending on the site-specific circumstances.
J	Total length (feet)		Line F divided by (Line H times Line I).
K	Selected trench length (feet)		Normally this would be based on the volume of waste to be disposed and the available site area. For some types of excavation equipment, such as scrapers (earth movers), there may be practical limits on trench lengths to avoid inefficiency. With other types of excavation equipment, such as track hoes, length of the trench may not be a constraint. The Kansas National Guard has informed KDHE that the preferred excavation equipment will be track hoes.
L	Number of trenches		Line J divided by Line K, rounded up to nearest whole number.
Check capacity			
			trenches
	times		feet (length)
	times		feet (width)
	times		feet (effective depth)
	equals		cubic feet
	This		the required volume in Line F.
Calculate earthwork volume			
			trenches
	times		feet (length)
	times		feet (width)
	times		feet (excavation depth)
	equals		cubic feet
	divided by		cubic feet per cubic yard
	equals		cubic yards
Calculate disposal area dimensions			
For stability and logistics (e.g., equipment maneuvering, soil stockpiling, etc.), we assume 30-foot spacing between the trenches.			
			trenches
	times		trench width (feet)
	plus		spaces
	times		space width (feet)
	equals		total width (feet)
	times		feet (length)
	equals		square feet
	divided by		square feet per acre
	equals		acres

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